SINI 2017 Track A
System Maintenance & Optimization

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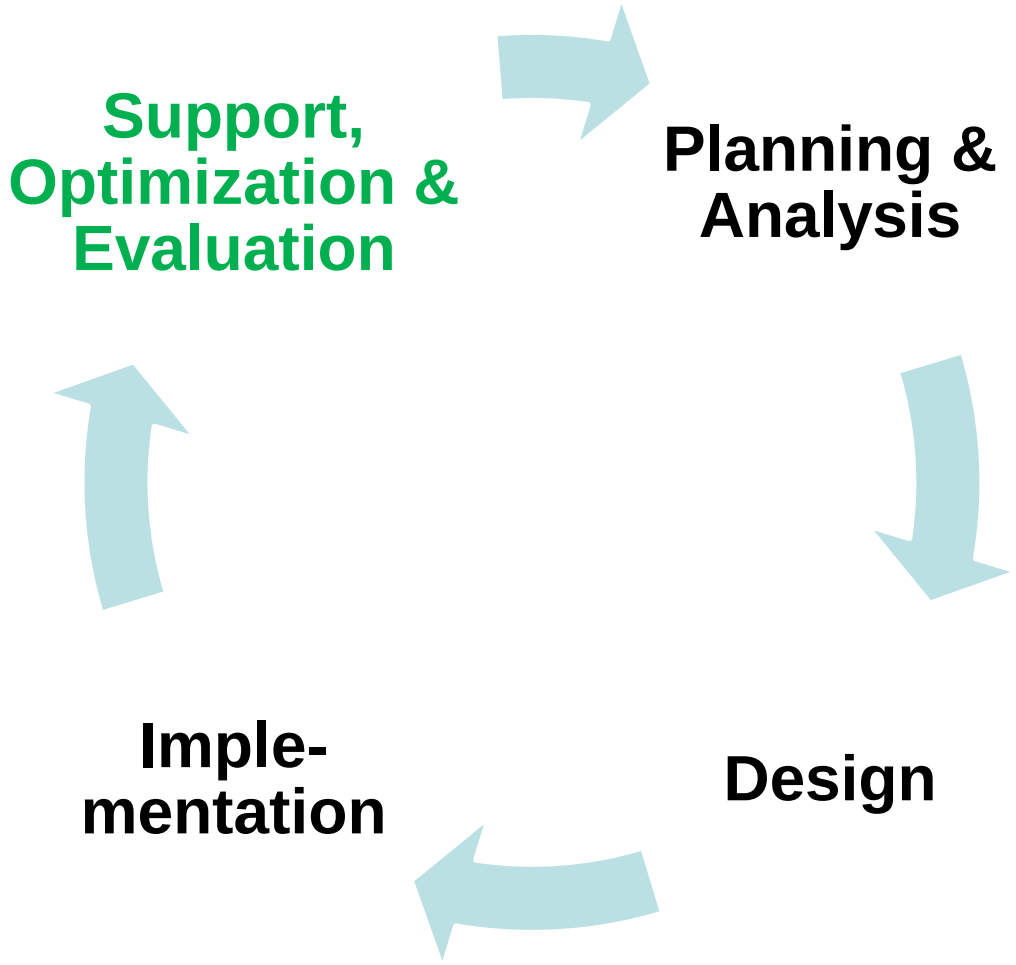
System Maintenance and Optimization

- Overview
- Tools
- Change management process
- Optimization
- Business Continuity Planning
- Case Studies

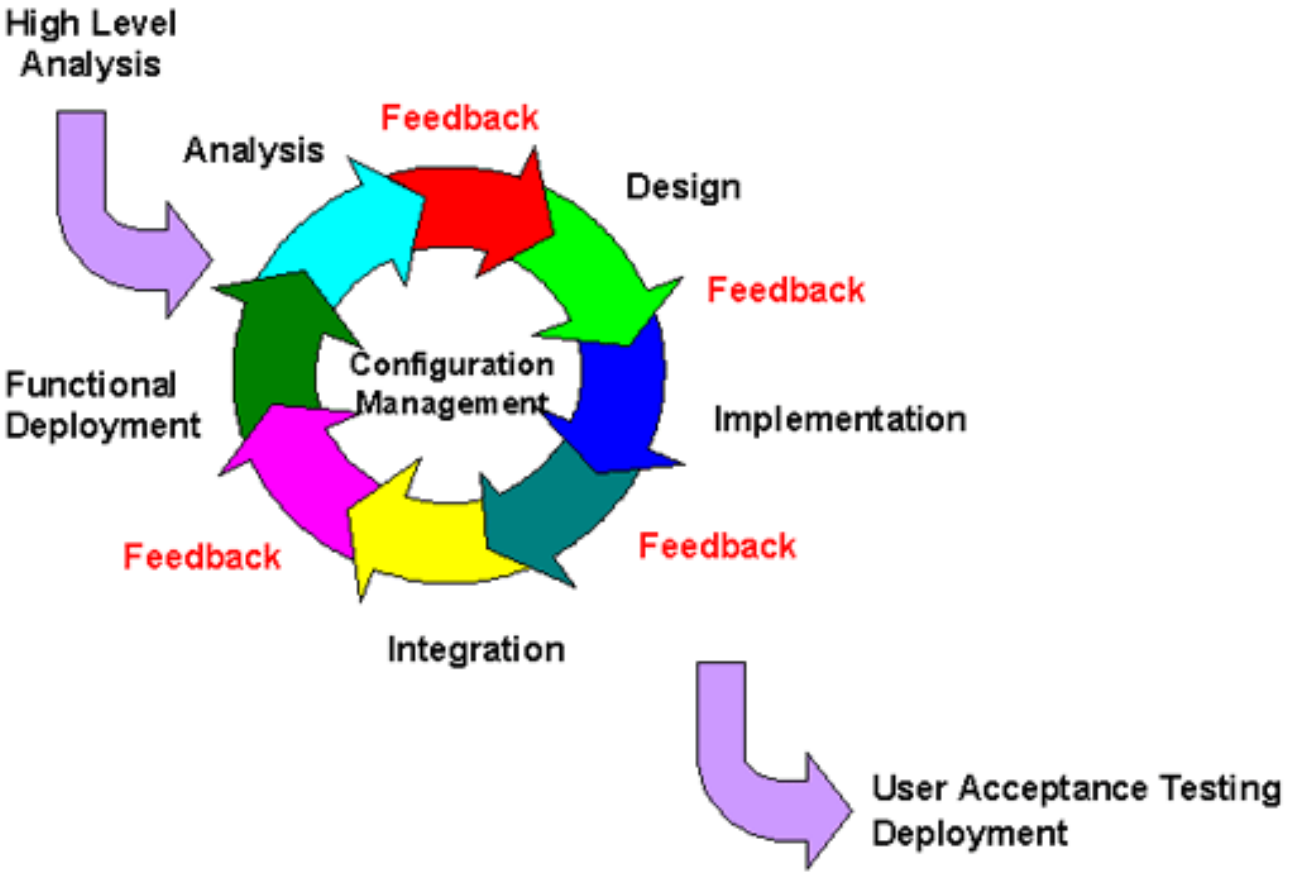
OVERVIEW: KEY CONCEPTS

Systems Development Cycle



Adapted from Wager, K., Lee, L., Glaser, J., Healthcare Information Systems, 2009, 146.

Systems Development Cycle

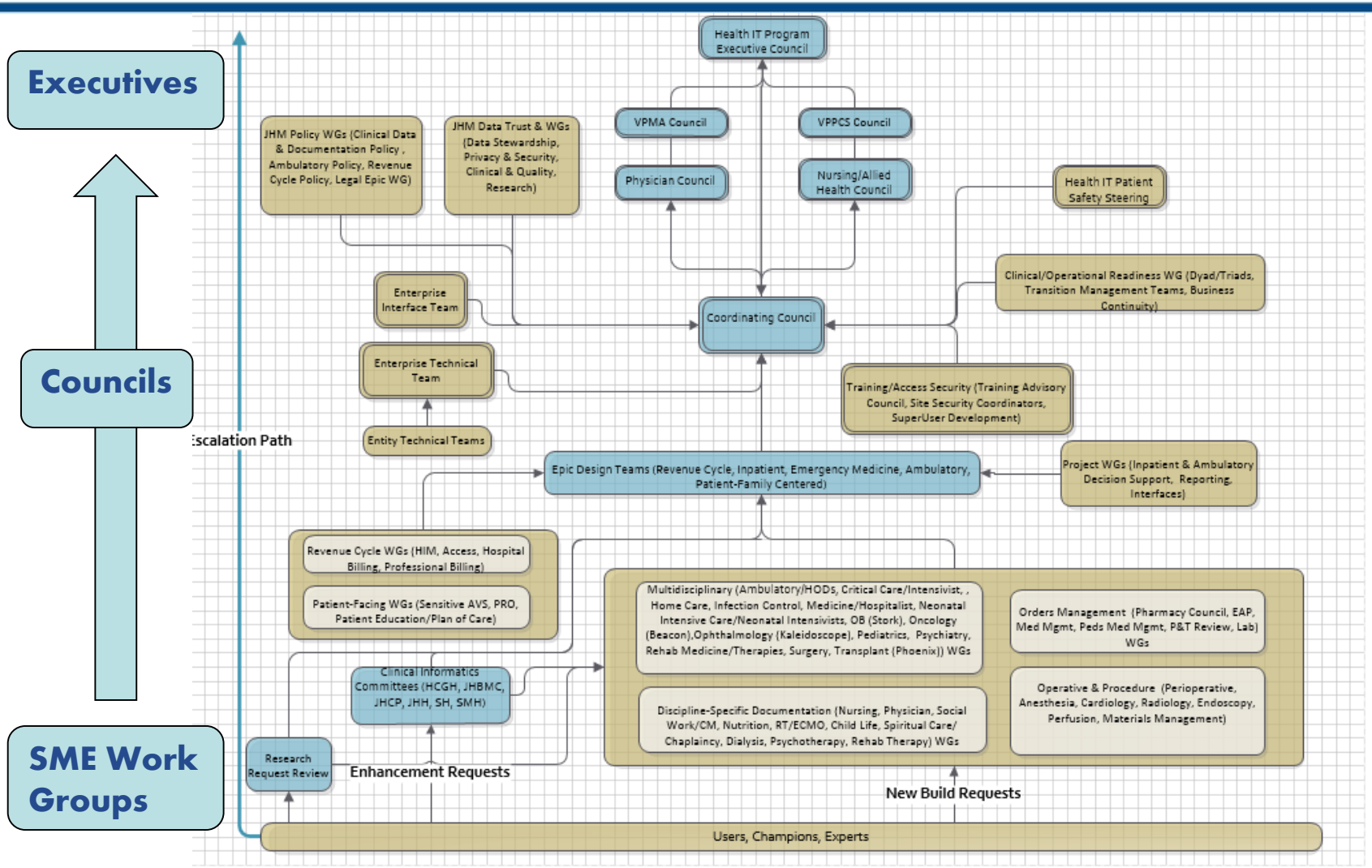


Project Iteration Flow

http://www.alchymy.com/ConquestOfSpace/developmentModel.html

Project Management

Governance & Escalation



Tools

- Problem Statement
- Issue tracking system
- Workflow diagrams
- Prioritization scale
- Lean tools
- Vendor websites
- ANIA & vendor listservs
- Diplomacy

SBAR

- **S**ituation
- **B**ackground
- **A**ssessment
- **R**ecommendation

Prioritization

JOHNS HOPKINS MEDICINE

- Safety
- Regulatory
- Productivity
- Revenue

Lean Methodology

- Listening to customer value
- Customer value
- Minimizing waste
- Repeatable processes
- Standard Work
- Lean toolkit
- PDCA or PDSA

SYSTEM MAINTENANCE

System Maintenance

- End User Support
- Change Management
  - Harmonization, governance
  - Change Control/Emergency Change Control
  - Testing, End user validation

- Issue Tracking & Assignment
- SBAR
- Session observation

System Maintenance: End User Support

- Roles & Issues
  - Super Users
    - Non-patient care time
    - Staying “current”
  - Clinical Informatics
- Budget/Resources
- Infrastructure
  - Help Desk, Escalation & High priority tickets
  - Integrated support (interfaced systems)

System Maintenance: Change Management Process

- Governance & Communication
- Work infrastructure (SMEs,Work Groups)
- Prioritization
- Tracking & documentation
- Change Control
  - Timing of changes
    - Allow for testing, communication & training
- User access management
  - Security & roles

System Maintenance: Break-fix vs. Enhancements

- Break-fix
  - Reproduce?
  - When/with whom does it occur?
  - Scope?
  - Impact?
  - Workaround?
- Enhancements
  - Rationale
  - Priority
  - LOE

System Maintenance: Planned & Unplanned Downtime

- Planned Downtime
  - Regular downtime window
    - Apply patches, updates
    - Enhancements

- Unplanned downtime
  - Clinical & Operational Business Continuity Plan
  - Technical support
  - Recovery

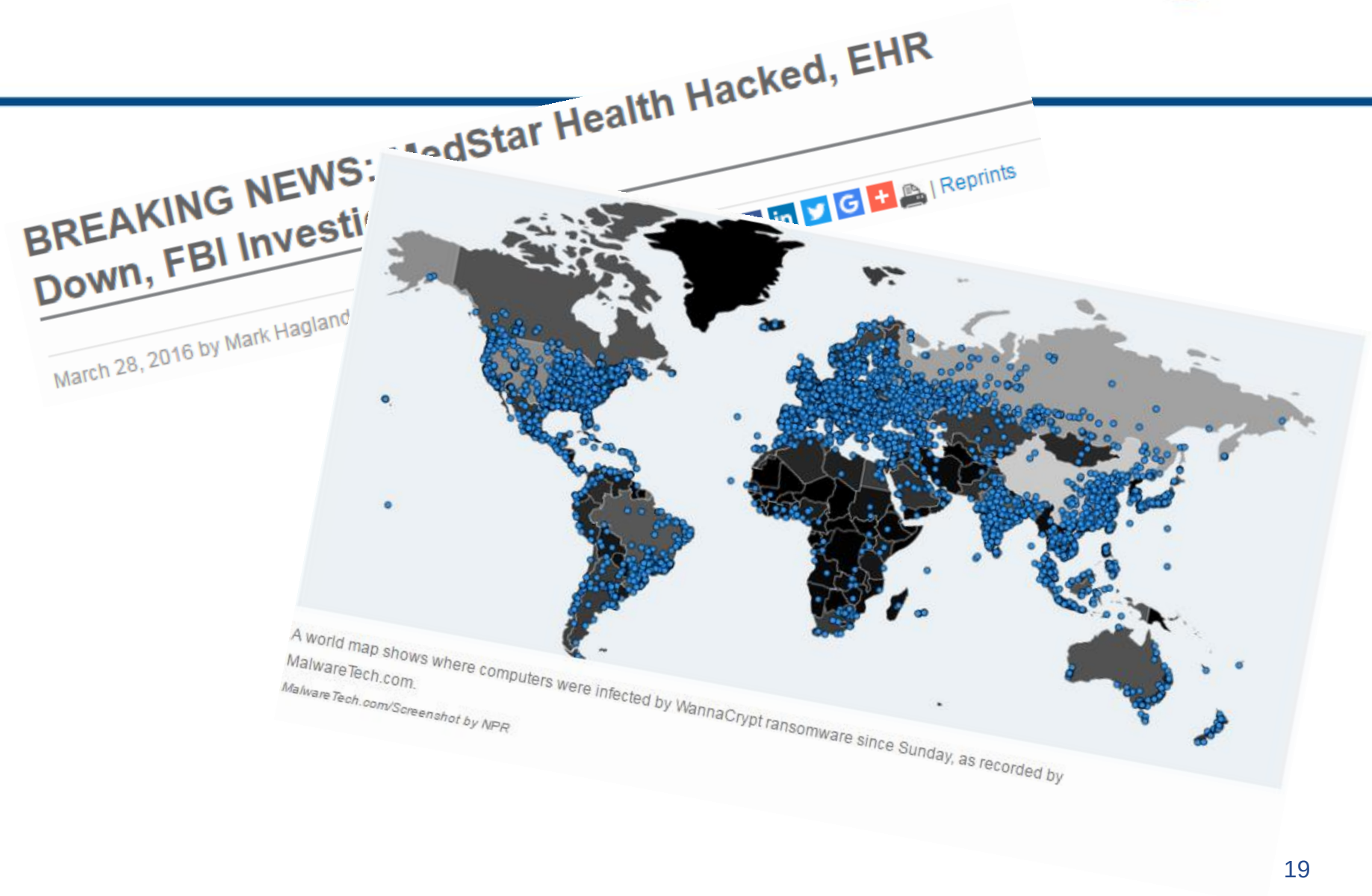
System Maintenance: Major Upgrades

- Decision making
- Prioritization
- End user support
- Other considerations

- Governance
- Scope
- Resources
- Time

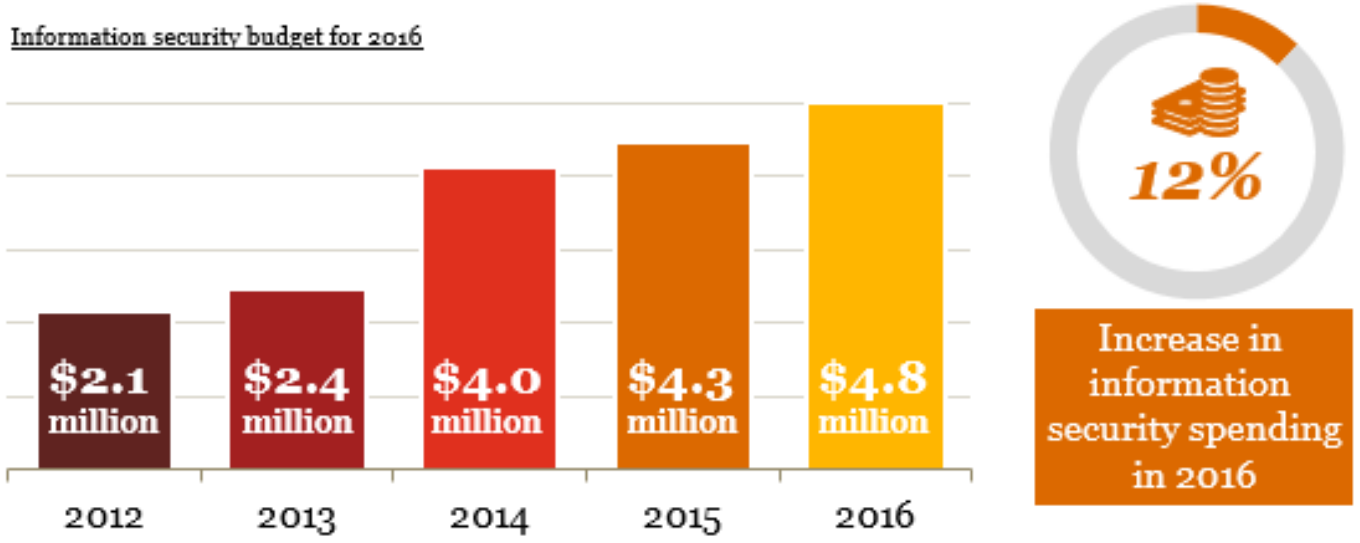
BUSINESS CONTINUITY PLANNING (BCP)

Call to Action



Skyrocketing Costs

Security budgets have more than doubled in the past four years. In 2016, the top drivers of security spending are medical devices, interactive communications and cloud adoption.



From PwC Consulting presentation, 2017

BCP: Building Resilience

- High reliability organizations
  - Patient Safety
  - Staff engagement & retention
    - Competency
- ENSURE SAFETY, COMPENTENCY, MINIMIZE RISK…
  - Situational Awareness
  - Continuity of Operations
  - Recovery

System Maintenance: Planned & Unplanned Downtime

- Core systems & related interfaced systems
- Hardware including printers
- Emergency Power supply
- Downtime tools
- Training
- Business Continuity Planning

Downtime & Business Continuity Planning: Key Concepts

- Uptime: 99.9999%
- Communication
- Technology
  - Redundancy
  - Failover
  - Recovery
- Clinical & Operational Readiness
  - Services each dept. can and cannot provide
- Incident Command

Case Study #1: Business Continuity Planning

Unplanned Technology Outage

Case Study #2: Practice BCP

- Due to recent malware activity across the globe, the CEO and COO have asked your department to conduct a Business Continuity exercise to simulate a technology outage within the next month.

Discussion

- Why do this type of exercise?
  - Should we make it “real”?
- What are major considerations?
- What other questions should be asked?
- How do you plan this activity?
  - What could you simulate?
- Who are key partners?
- What are the goals? Scenario?
- How would you evaluate effectiveness?

Business Continuity Planning

- BCPs
- Technology & Tools
  - Emergency Workstations
  - Patient care reports
    - Non-network dependent
  - Downtime forms
  - Downtime “Kits”
- Communication
- Training

Tools & Technology

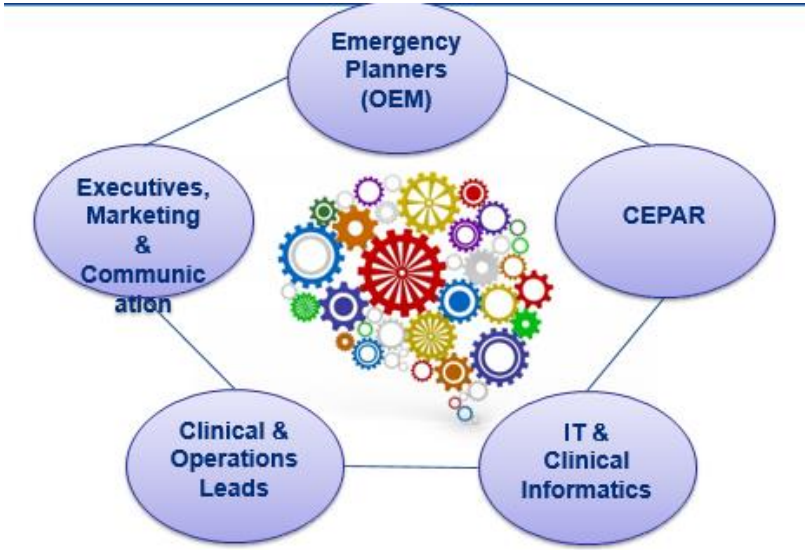
- Forms
- Workstations & printers
- Patient Care reports
  - Throughput
- Downtime EMR environments
  - Read only
  - Web server
- Communication tools
  - With & without network
    - RAVE, Netfinder, NetPresenter, Assurance NM

Governance, Practice, Accountability

- Organizational priority
- BCA Steering Committee
  - Interdisciplinary, all entities
  - Task Forces
    - Communication, Forms, Reports, Technology, Recovery, Policies
- Executive visibility
  - Simulation Exercise
  - Workstation check compliance

Planning & Executing Practice Exercise

- Stakeholders
- Scenario
- Assignments
- Project Planning

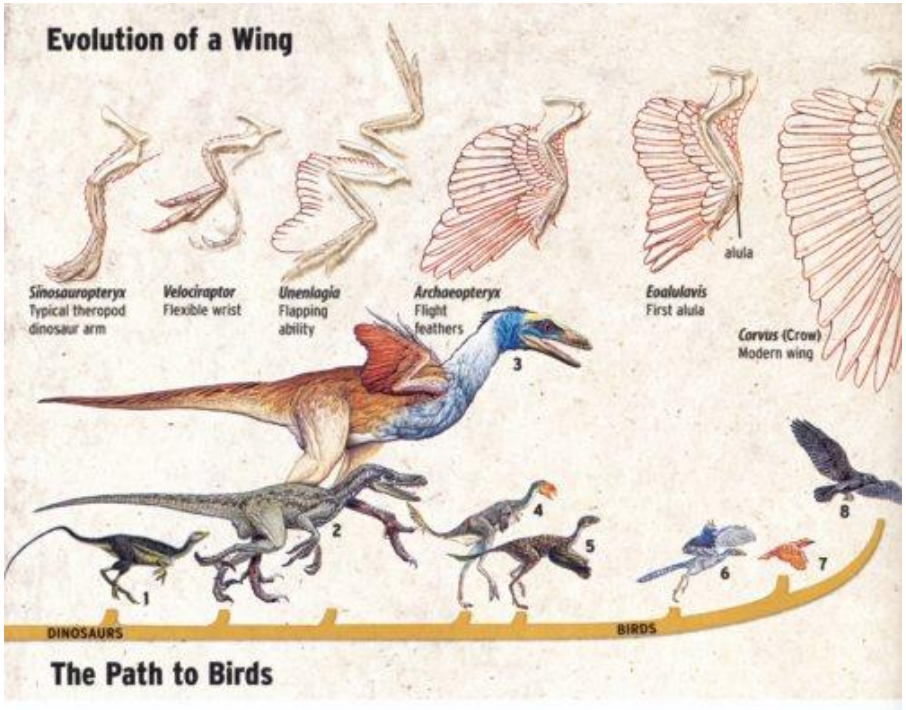


Planning & Executing Exercises Lessons Learned

- Operations
  - Interdepartmental plans & longer term outages
- Training
  - Providers
- Tools
  - Downtime forms
- Technology
  - Downtime workstation checks
- Communication
  - Fax machines are often networked

OPTIMIZATION

Optimization



Evolution: …Process of formation or growth; development. A product of such development. A process of gradual, *peaceful*, progressive change…

Optimization

- Improvements
  - Post “stabilization”
  - Usability
  - Support users & organizational goals
  - Iterative
- Guiding principles
  - Leadership buy-in→ Transition Management
    - Champions
  - Project Management
  - Lean Management

- Governance
- Scope
- Resources
- Time

Optimization Examples

- Medication administration
- Blood administration
- Lab specimen collection
- Discharge Workflow & Instructions
- Nursing documentation efficiency

- Define problem
- Workflow analysis, redesign
- Interim Solution
- Communication
- Development
- Transition Management
- More development

Case Study #2: Optimization Discharge Instructions Improvement

System-wide change

Case Study #1: Discharge Instructions need improvement

- Executive Charge: Improve data entry process & output/final product

- Case Managers & Post DC nurses are telling leadership that DC Instructions are missing critical data that patients need and this may be contributing to readmissions.
- Providers consistently report that the workflow to discharge patients takes them “hours”, they are not sure what info needs to be there, and …
- Pts & families report info is confusing, too long.

Discussion

- How do you understand more about root causes?
  - What processes/tools would be most helpful?
- Which stakeholders, champions?
- How do get stakeholders to focus on a systems approach, not just the technology?
- How is disagreement handled (priorities)?
- How will the work be evaluated?

Define the problem

- Clear problem definition takes time
- Resources
  - Q storming
    - Make your ideas visual, consequential
    - Problem needs to matter to others
  - Drawing Toast – TEDD Talk*

*https://www.ted.com/talks/tom_wujec_got_a_wicked_problem_first_tell_me_how_you_make_toast

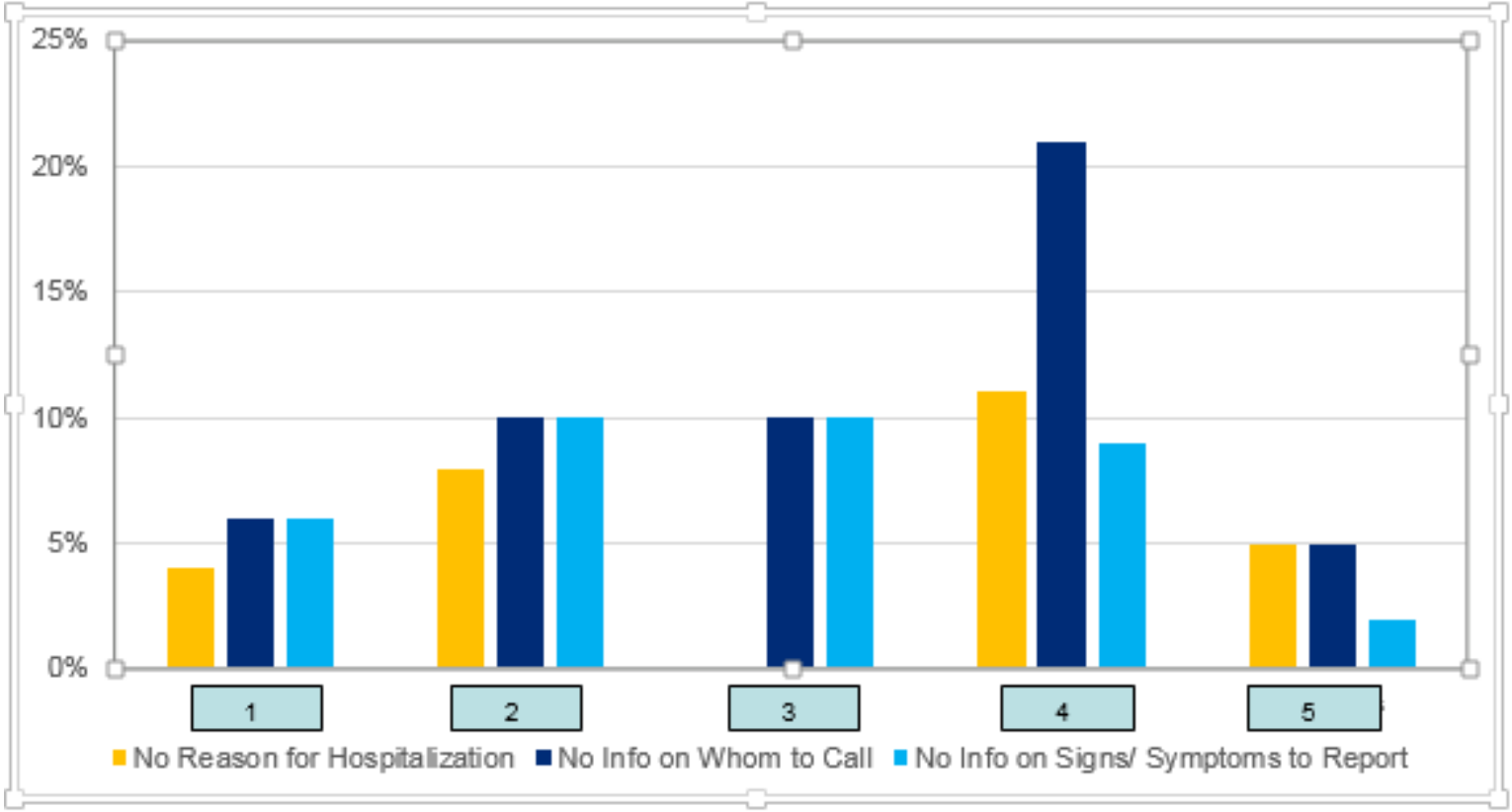
Identify Stakeholders

Leadership	SMEs	SMEs	EMR Project team
Clinical & Operational Leads	Providers	Pharmacists	Project Manager
Clinical Informatics	Home Care	Care Management	Developers & Technical Experts
	Service Excellence	Inpatient Nurses	
	Patient Education	Patients	

Collect Data

300 Discharge Instructions Reviewed

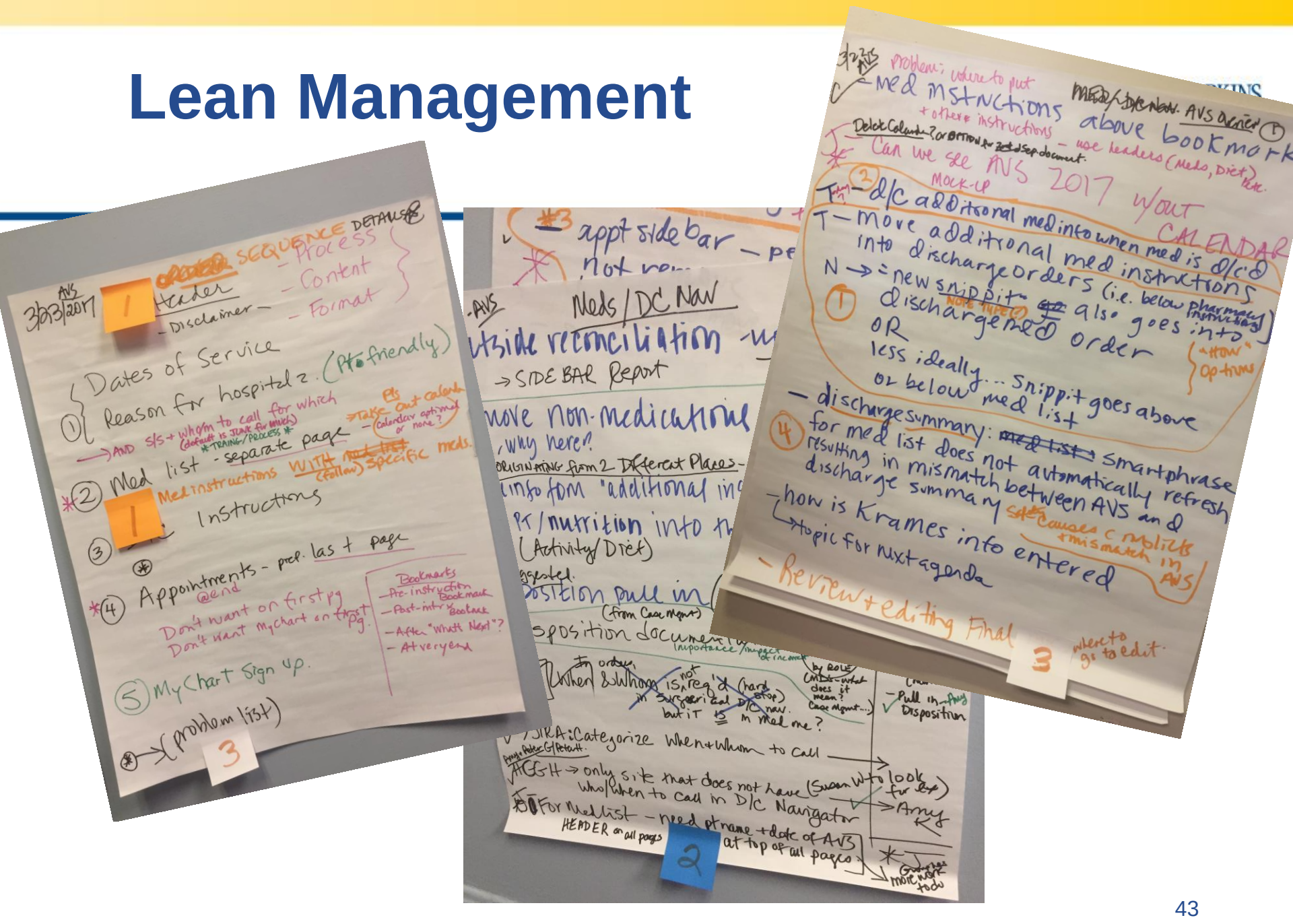
- Missing, unclear, buried, conflicting information



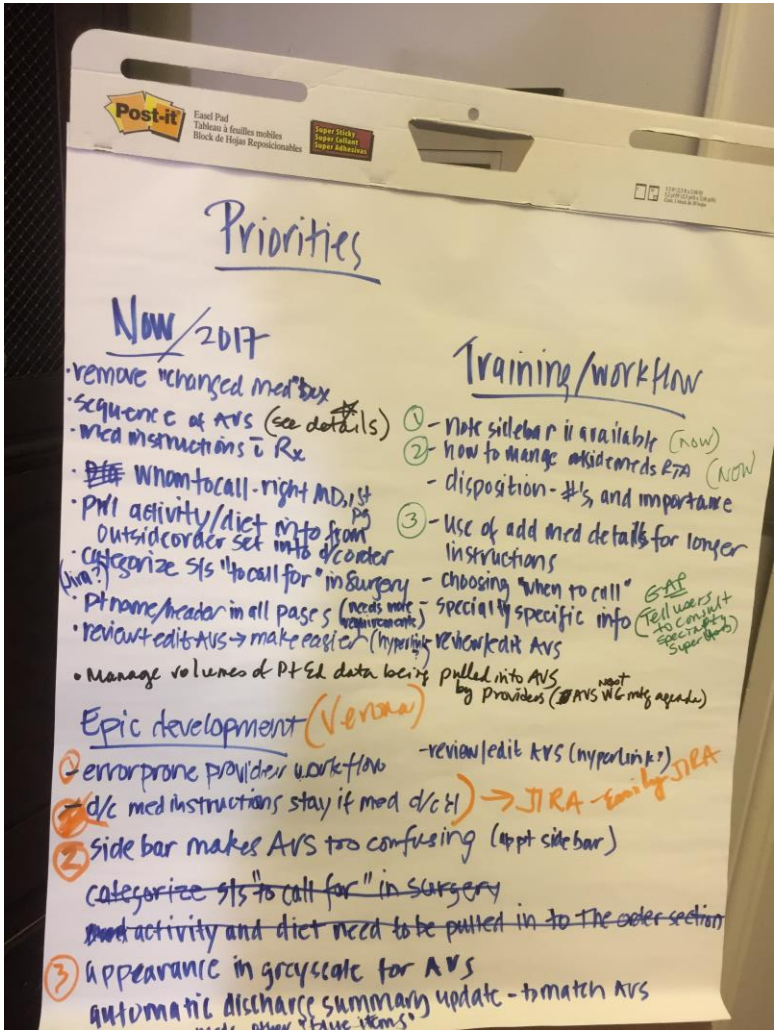
Establish Goals

- For patients: Improve AVS clarity, completeness, accuracy, ease of use
- For providers: Improve usability & data entry experience
  - Less time consuming, more intuitive
  - Guide completeness, clarity & accuracy AVS display
- For project team: Fewer versions

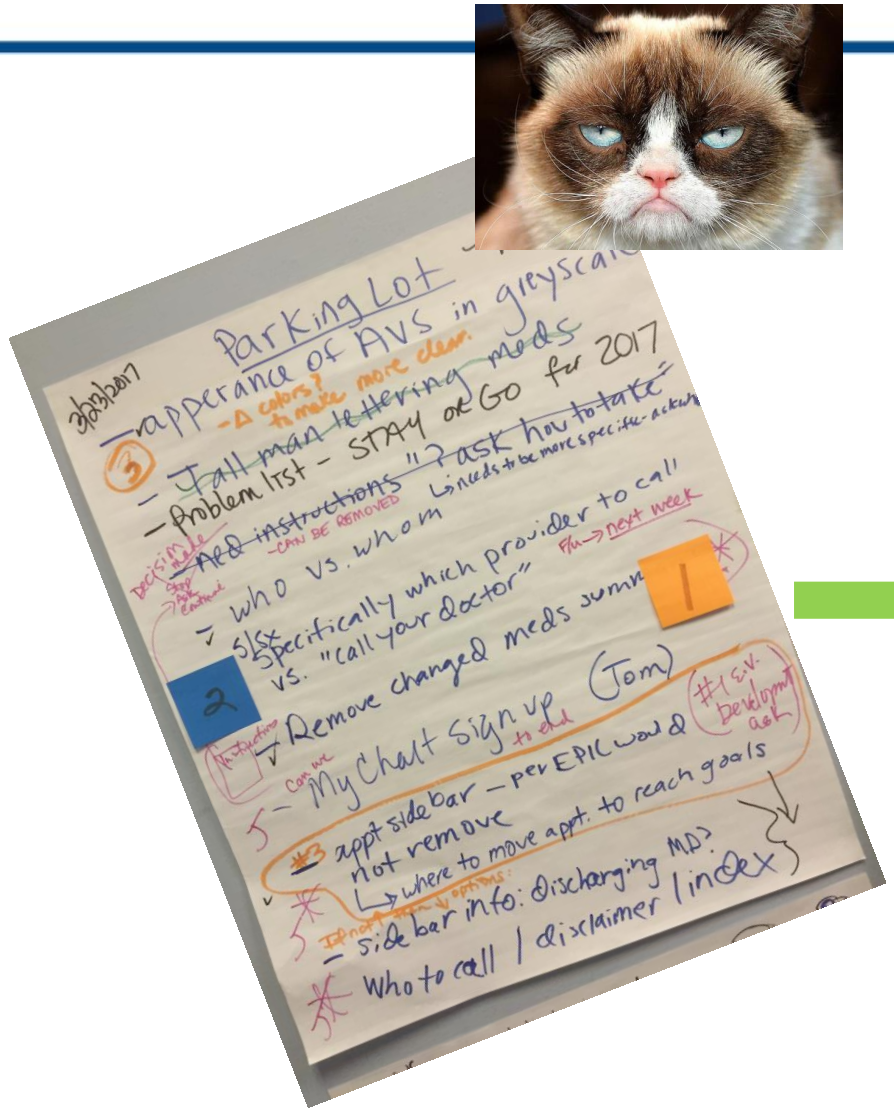
Lean Management



Categorize & Prioritize



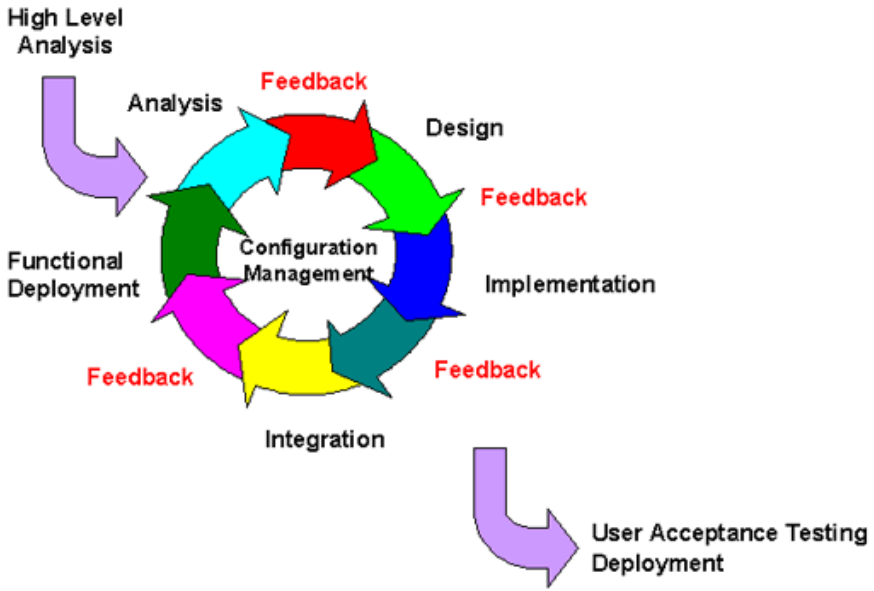
Future: Parking Lot Items



EMR Development Priorities

Iterative Cycles: Mock-up, Feedback, Governance

- Smaller groups
- Involve patients
- Governance
  - Design Work Groups
  - Executive review
- 3 months + testing



Project Iteration Flow

patient- and family-centered care

For PATIENTS…Top AVS Display Issues

JOHNS HOPKINS MEDICINE

1. Medication Orders & Instructions
   - Missing information, have duplicate or contradictory orders/information.
   - Medication Calendar not used correctly – confusing and inaccurate
2. Reason for hospitalization*, Whom/when/how to contact (specific)
   - Missing or unclear information: Whom to call for what
3. Too long, cluttered, TMI (non-value add)
   - Too wordy, confusing/contradictory/redundant free text, often in non-patient friendly language

* *Patient Friendly Reason

For PROVIDERS…
Top Concerns identified

JOHNS HOPKINS MEDICINE

Discharge & Med Rec processes

1. Not intuitive enough, time-consuming to edit
2. Minimal “hard stops” & embedded “tool tips”, editing is time-consuming, not clear
   - Workflow is challenging to consistently follow
   - Not clear what patients will see on AVS
3. Multiple changes since Go live
   - Many users *not sure of* best workflow

patient- and family-centered care

For PATIENTS…
Improvements in AVS Display

JOHNS HOPKINS MEDICINE

1. Medication Orders & Instructions
   - Removed Medication Calendar, promote *Refrigerator list*
   - Added “Complex Med” section for Insulin, Prednisone, Warfarin…reduce free text scattered throughout AVS
2. Reason for hospitalization*, Whom/when/how to contact (specific)
   - New Order Sets for Community Hospitals, JHBMC Surgery
     - Specifies information including 24/7/365 phone number

* Patient Friendly Reason

patient- and family-centered care

For PATIENTS…

JOHNS HOPKINS MEDICINE

Improvements in AVS Display

3. Appearance: Too long, cluttered, TMI (non-value add, NVA), B/W printing not clear
   - Removed NVA text; prioritized first page information
     - 2017 AVS replaces words with icons
   - Reduced AVS SideBar content, Med List separate.
   - Revised how and where Patient Education material is embedded – separate from AVS.
     - Less likely for actual provided-entered instructions to be “buried”
   - Home Care Arrangements section shortened, redesigned
     - Replaced terms with more succinct, clear, patient-friendly language
   - Received requested fix to B/W printing clarity

* Patient Friendly Reason

**For now, can use Krames Med Calendar – manual entry

For PROVIDERS…Improved Discharge Workflow…Data Entry

JOHNS HOPKINS MEDICINE

1. Not intuitive, time consuming to edit
   - *NEW* SideBar report for providers to see what other clinicians have ordered (while placing orders & entering instructions) without scrolling to view
2. Minimal "hard stops" & embedded "tool tips"
   - Training team will enhance with embedded "just in time" training links.
   - DC Navigator re-sequenced to be more intuitive
3. Multiple changes since Go live
   - Training current users in July to reinforce recommended workflows to support new trainees

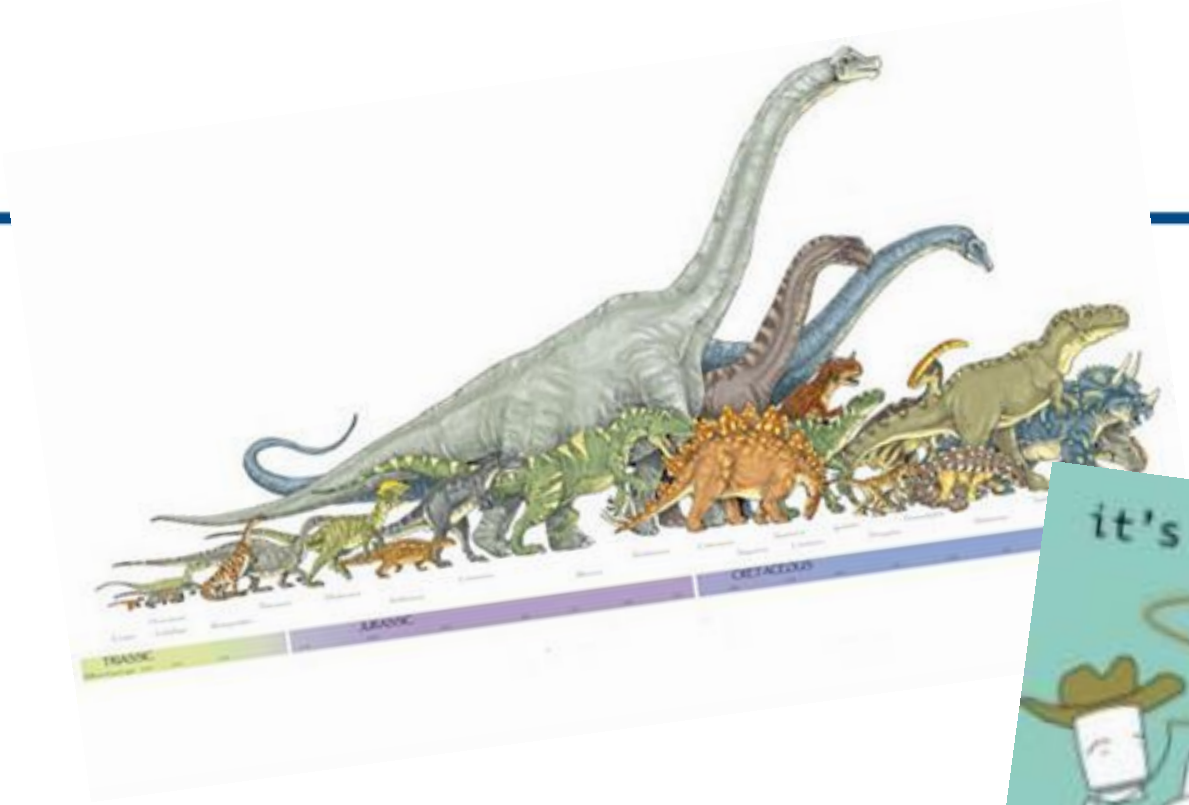
- Includes: Add Med Details (with limits), Managing external meds

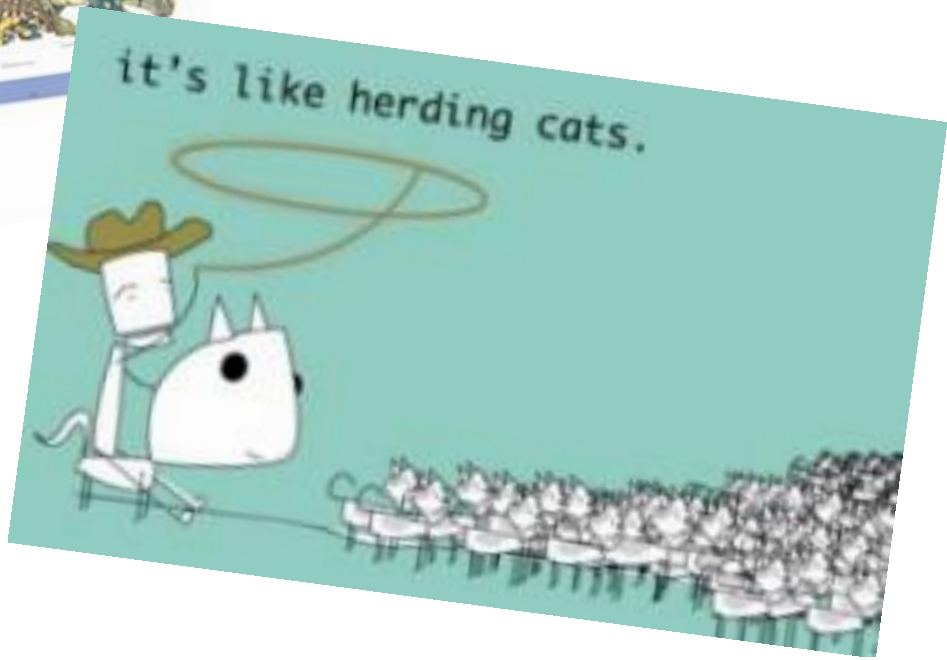
Evolution of solution

- Define problem
- Workflow analysis, redesign
- Interim Solution
- Training
- Communication
- Development
- Transition Management
- More development

Sustain the gain

- Communicate
- Celebrate success
- Lean methodology
  - Ongoing feedback & evaluation
- Visibility: Quality & Safety Dashboard
- Monitor Patient Safety events





EVOLUTION OF SOLUTIONS

Evolution of solutions

- Define problem
- Workflow analysis, redesign
- Interim Solution
- Training
- Communication
- Development
- Transition Management
- More development

Thank you Kerri Godwin, RN-BC, MS & Kelly Turner, RN, CCRN
JHBMC Clinical Informatics Team & JHM Epic Project Team

DISCUSSION

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References

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- *What's Lean*. https://www.lean.org/WhatsLean/